



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/531,208

04/14/2005

Mitsuru Ueda

28955.1048

6424

27890 7590 12/17/2008
STEPTOE & JOHNSON LLP
1330 CONNECTICUT AVENUE, N.W.
WASHINGTON, DC 20036

EXAMINER

LEE, SIN J

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

12/17/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/531,208	Applicant(s) UEDA ET AL.	
	Examiner Sin J. Lee	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 August 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 and 19-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-17, 22, 24, 28, 30, 31 and 35 is/are allowed.
- 6) ☒ Claim(s) 19-21, 23, 25-27, 29 and 32-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6/20/08</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. In view of the amendment, previous 102(b) rejection on claims 26, 28, 29, 33 and 35 over Ito et al (Polymeric Materials Science and Engineering, vol.81, pg.51-52) and previous 102(b) and 103(a) rejections over Tully et al (Proceedings of SPIE, vol.3999, pg.1202-1206) are hereby withdrawn.
2. Due to newly cited prior arts, the following rejections are made non-final with the Examiner's sincere apology.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

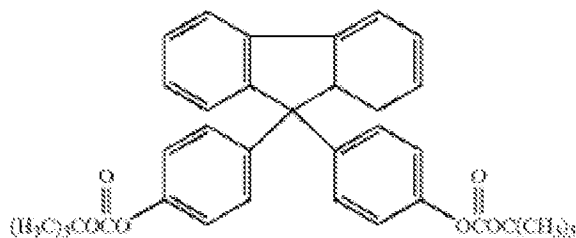
A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

4. Claims 27 and 34 are rejected under 35 U.S.C. 102(a) as being anticipated by Hanabata et al (WO 02/079131 A1) (with its English equivalent, Hanabata et al (US 2003/0211421 A1) being used here for English translation purpose).

Hanabata teaches a photosensitive resin composition containing a base resin, a photoactive compound and a photosensitizer (see [0121] of English equivalent).

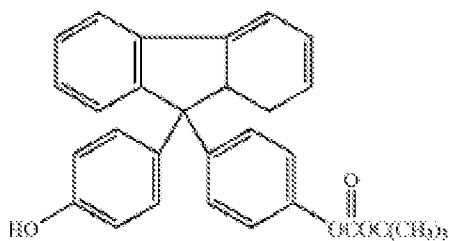
In Example 20, Hanabata teaches the following compound as one of example for the photoactive compound;



Compound 20

This compound teaches present compound of claim 27 (present B, C and D being –
(CH₂)_s-P-(O-C(=O))-O-Q (s = 0, Q being an organic group having 4 carbon atoms, r=1)
or Ar- substituted with RO- in which R is t-butyloxycarbonyl).

Also, in Example 111, Hanabata teaches the following compound as one of example for the photoactive compound;



Compound 111

Compound III . This compound teaches present compound of claim 27 (present B, C and D being Ar- substituted with RO- in which R is H atom and – (CH₂)_s-P-(O-C(=O))-O-Q (s = 0, Q being an organic group having 4 carbon atoms, r=1) or Ar- substituted with RO- in which R is t-butyloxycarbonyl). Hanabata also teaches (see [0140] of English equivalent) the use of an organic solvent. Thus, Hanabata teaches present inventions of claims 27 and 34.

Claim Rejections - 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

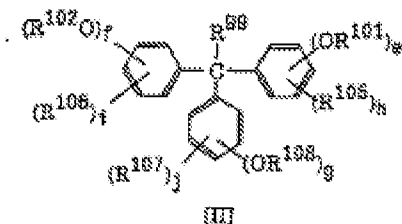
6. Claims 27 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meier et al (5,124,233).

Meier teaches (see abstract) a photoresist composition containing an epoxide resin, a latent urea or imidazole hardener for the epoxide resin and an iron-arene complex. Meier also teaches (col.4, lines 58-60, col.5, line 33) that his composition can contain sensitizer such as fluorene. It would have been obvious to one skilled in the art to use fluorene as Meier's sensitizer with a reasonable expectation of obtaining a resist composition having good properties towards heat and chemicals. Fluorene teaches present compound of formula (1) in which B, C and D are all H atoms. Thus, Meier's teaching renders obvious present invention of claims 27 and 34 (Meier teaches the use of a solvent in col.3, lines 31-35).

7. Claims 21 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aoso (JP 2002-229193 and its machine-assisted English translation provided by JPO).

Aoso teaches (see English abstract) a positive resist composition containing (A) a compound having a disulfone group, (B) a low molecular dissolution inhibiting compound and (C) an alkali-soluble resin.

As one of examples for the component (B), Aoso teaches (see [0079]) the following;



Aoso teaches ([0091]) that e, f, g, h, i and j can each be 0 or 1-5. Aoso teaches ([0083]) that R^{101} , R^{102} and R^{108} can be $-R^0-COO-C(R^{01})(R^{02})(R^{03})$ or $-CO-O-C(R^{01})(R^{02})(R^{03})$, in which R^0 represents an *aliphatic* or aromatic moiety and $R^{01}-R^{03}$ can be an alkyl group such as a methyl group ([0073]-[0074]). It would have been obvious to one skilled in the art to have h, i and j to be 0; have e, f and g to be 1; have R^{101} , R^{102} and R^{108} to be $-R^0-COO-C(R^{01})(R^{02})(R^{03})$ with R^0 being methyl (methylene) group and $R^{01}-R^{03}$ being methyl groups with a reasonable expectation of obtaining a positive resist composition having satisfying sensitivity, resolution and resist shape. Thus, Aoso's teaching renders obvious present invention of claim 21 (present B, C and D being t-butoxycarbonylmethyl group and present X, Y and Z being an ether bond).

8. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Aoso (JP 2002-229193 and its machine-assisted English translation provided by JPO) in view of Niinomi et al (Proceedings of SPIE, Vol.2724, Advances in Resist Technology and Processing XIII (1996), pg.174-185).

Aoso does not explicitly teach present range for the basic impurity content. It is well known in the art that basic impurities in a resist composition causes the problem of post exposure delay (PED), as evidenced by Niinomi et al, pg.174, last paragraph. Therefore, it would have been obvious to one skilled in the art to reduce any basic

Art Unit: 1795

impurity content in Aoso's photoresist material as low as possible in order to avoid the PED problem. Present range of 10 ppm or less for the basic impurity would have been obvious to one skilled in the art at the time the invention was made, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

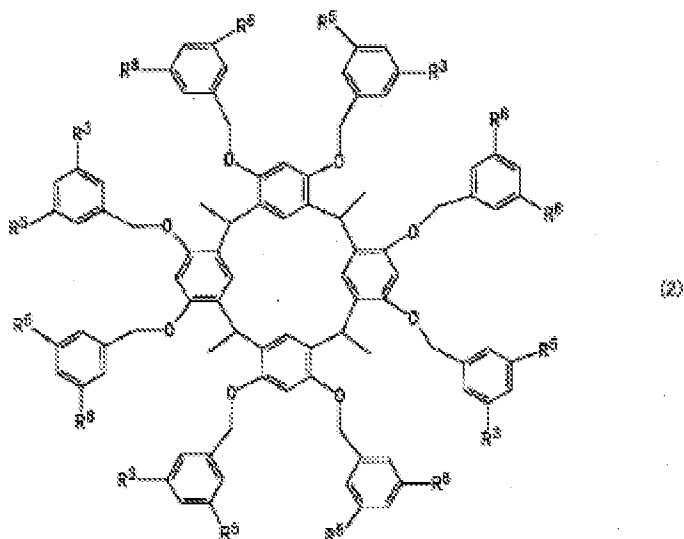
Therefore, Aoso in view of Niinomi would render obvious present invention of claim 19.

9. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Aoso (JP 2002-229193 and its machine-assisted English translation provided by JPO) in view of Niinomi et al (Proceedings of SPIE, Vol.2724, Advances in Resist Technology and Processing XIII (1996), pg.174-185) and Zhong et al 7,013,965).

As discussed above, based on Aoso in view of Niinomi, it would have been obvious to reduce basic impurity in Aoso's composition in order to avoid the PED problem. It is known in the art to remove basic impurities in a composition by treating the composition with acid and with ion exchange resins as evidenced by Zhong et al, col.5, lines 9-10. Therefore, it would have been obvious to one skilled in the art to reduce any basic impurity in Aoso's composition by using art-known methods such as treating with acid and ion exchange resins in order to avoid the PED problem. Therefore, Aoso in view of Niinomi and Zhong would render obvious present invention of claim 20.

10. Claims 25, 26, 29, 32 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueda (JP 10-310545 and its machine-assisted English translation provided by JPO).

Ueda teaches a composition containing phenolic dendrimer compound (see English abstract). Ueda teaches (see [0010]) the following compound to be his phenolic dendrimer compound;



In the formula, R3, R5, R6 and R8 can be hydroxyl group as well as alkoxycarbonyl group (such as t-butoxy group – see [0008]) provided that at least one of them has to be a hydroxyl group (see [0006]). It would have been obvious to one skilled in the art to have R3, R5, R6 and R8 to be alkoxycarbonyl groups and hydroxyl groups with a reasonable expectation of obtaining a resist composition excellent in sensitivity and resolution. Such compound teaches present inventions of claims 25, 26 and 29 (present B, C and D would be Ar-CH2- substituted with RO-(where R is H atom) and/or ROCO- (where R is t-butyl)). Thus, Ueda's teaching renders obvious present inventions of claims 25, 26, 29, 32 and 33 (Ueda teaches the use of solvent for his composition in [0048]).

Allowable Subject Matter

Art Unit: 1795

11. Claims 1-17, 22, 24, 28, 30, 31 and 35 are allowed. None of the cited prior arts teaches or suggests present photoresist base material *consisting essentially of* the compound of formula (1) of claim 1 or 5. Ueda (JP'545) does not teach or suggest present compound of claim 22 with present B, C and D group recited in the claim (since in Ueda, at least one of R3-R8 has to be –OH group whereas in present claim 22, B, C and D cannot be –OH group). None of the cited prior arts teaches or suggest present compound of formula (1) in present claim 24 with those B, C and D recited in the claim. None of the cited prior arts teaches or suggest present compound of formula (1) of claim 28 with those B, C and D recited in the claim (Ueda (JP'545) does not teach or suggest present compound of claim 28 because in Ueda, at least one of R3-R8 has to be –OH group whereas in present claim 28, B, C and D cannot be –OH group).

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sin J. Lee whose telephone number is 571-272-1333. The examiner can normally be reached on Monday-Friday from 9:00 am EST to 5:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly, can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is **571-273-8300**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

Art Unit: 1795

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Sin J. Lee/

Primary Examiner, Art Unit 1795

December 15, 2008